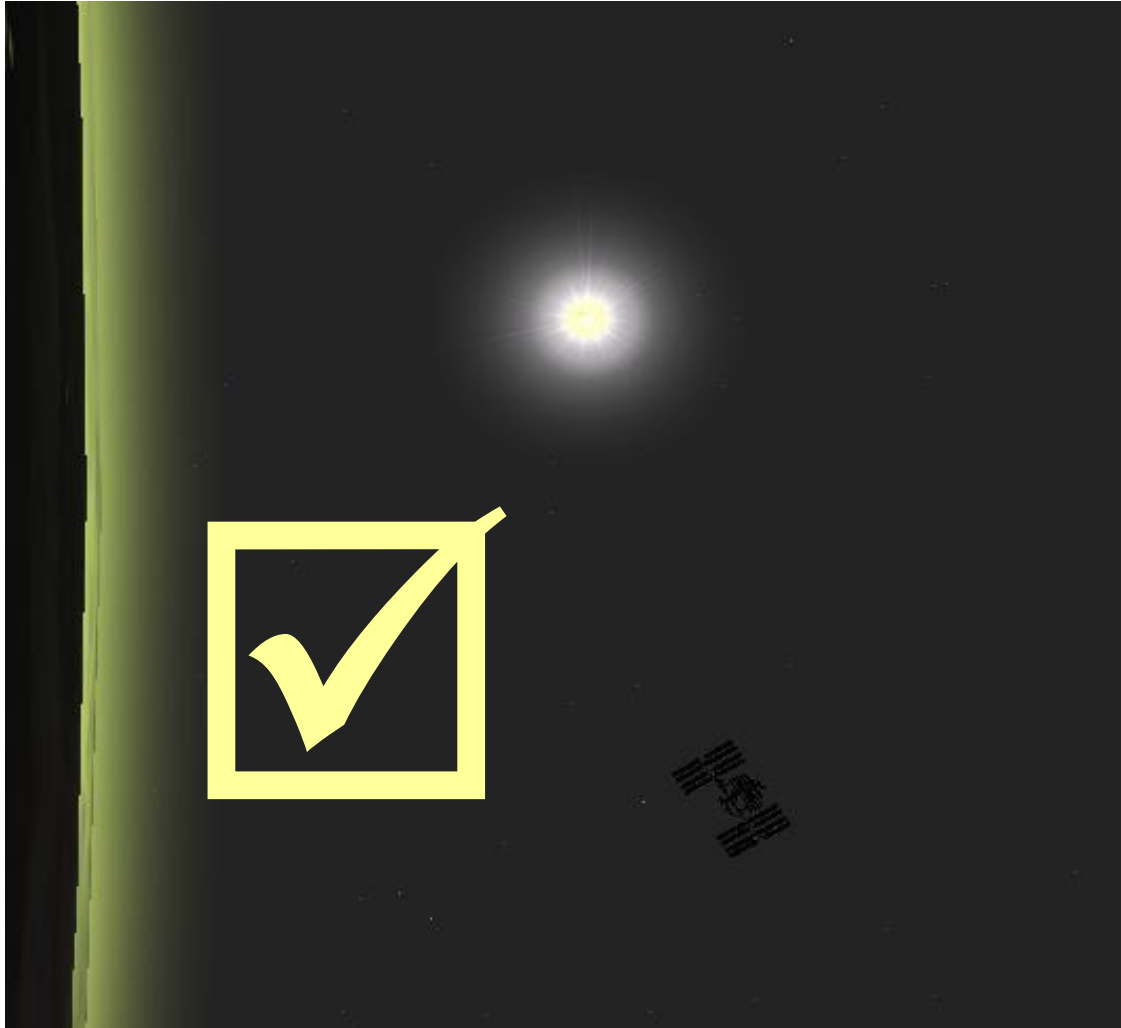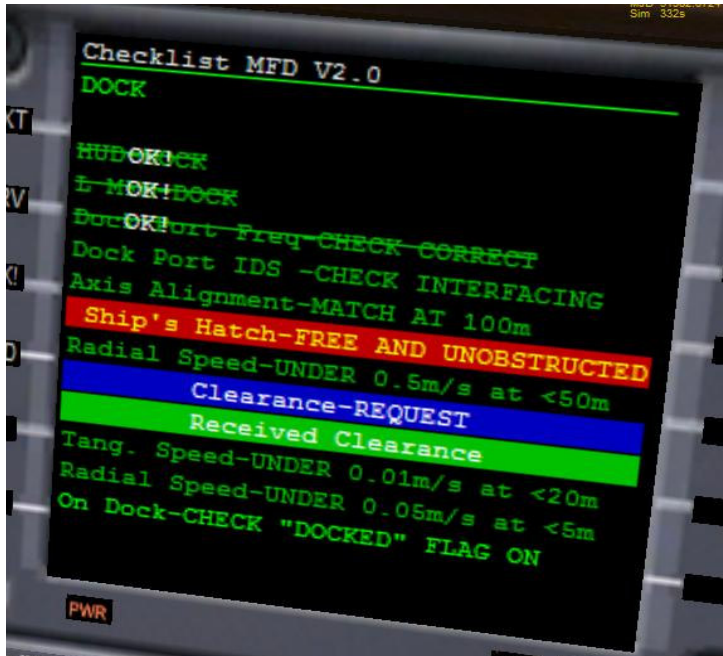# Checklist MFD User Manual V2.0

Introduction

A Checklist is essentially a list of tasks you should perform at each phase of a mission, disposed in a form devised to help the pilot to remind every step and record the completion of each one.

In the Orbiter fleet this is now accomplished with the help of Checklist MFD. Besides the MFD is intended to give the user the thrill of a real mission by offering instructions for a detail rich operation of the vessel.

A General Checklist Form is provided for this version, nevertheless Checklist MFD can be customized to fulfill the particular needs of your mission with a simple Notepad creation of a checklist , provided you follow very simple formatting rules.

Operation

Each Checklist file is divided in chapters. A chapter comprises all the tasks for given a mission phase such as an Orbital Docking or an Atmospheric Descent. Each chapter has below its title, one or more lines that should be checked one by one as you proceed verifying each step. The MFD screen can accomodate up to 14 lines at a time i.e. in a single page. If the chapter has more than 14 lines, a new page is exhibited when the last task of the current one is checked.

Use **SHIFT-I** to Make Checklist MFD appear.

SHIFT-+ advances to the next chapter available. **SHIFT--** returns to the previous chapters. Use them to select the chapter that best suits the current phase of you mission.It's important to say that each time a chapter is changed, the current checked lines are cleared, so going out and getting back can be a handy way to restart your checking with a renewed, decluttered list.

After you finish with a line ,press **SHIFT-]** to mark it as checked. There`s no "going back" about checklist markings. If you make a mistake or are not sure you should start it all over again.

You can load other Checklist File with new chapter and pages pressing **SHIFT-L**.The files should be always under the folder *Checklist* inside the orbiter directory. This includes subfolders under the *Checklist* folder such as for example *Checklist\Mars_Expedition* Fill the input box with the file name including the extention (.txt for example) and the name of the folder(s) under the *Checklist* folder if this is the case.

As usual, turn Checklist MFD off with a **SHIFT-Q**. The current chapter, page and line are maintained and will be there when you press **SHIFT-I** to call your checklist again.

Customization

Checklist MFD comes to its full potential when you customize it to show particular data of you mission such as:

Radial acc=0.51M/S2
Tgnl acc= 10.8M/S2
Pitch =1.12DEGREES
MECO: Vr=78.7M/S@6092M Alt
MECO: Vt=1377M/S@87861M Dist

In this version customizing is accomplished by creating one or more alternative checklist files that can be loaded at run time using the procedure indicated above

All checklist files should be under the \Checklist folder. It's possible to load them from subfolders under the \Checklist directory so you can organize your files better.

In order to work properly the checklist text file should meet some especifications regarding its format. Refer to SPCCHECK.txt as a reference.

NO ERROR TRAPING WAS PROVIDED FOR ERRORS IN THE CHECKLIST FILE SO THE RESULTS MAY AND WILL BE UNPREDICTABLE. BE SURE TO FORMAT YOUR FILE PROPERLY.

1-The first six lines are ignored by the program. Use them to whatever message or directions you want your checklist to have.

2-Each chapter always starts with a line of 35 underscores. Do not use underscores anywhere else.

3-Below the line above comes the title of your chapter. Use uppercase letters and keep the line below 35 characters.

4-Leave a blank line between the title and the first task line.

5-The checklist steps follow. Be sure each line is under 35 characters long.

6-You can set a foreground and background color for a line by beggining the line with a simple *XXXX command. See the explanation below

```
Spaceship General Checklist Version

CRITERIA:

GENERIC
PURELY COSMETIC ALLOWED IF REFER
_____
BEFORE START

Proximity Radar/EICAS-ON THEN OFF
Engine Information HUD-CHECK ON
Attitude Controls-CHECK OFF
Fuel Qty-CHECK
Doors-CLOSE
Throttle-ON IDLE
Aero Surfaces&RCS-FREE & CORRECT
Voice Comm Radio-ON
*BWNBVoice Comm-CHECK
Planetarium NAV HUD-CHECK
HUD-ON & CHECK ALL MODES
HUD-SURFACE
Time & Date HUD-ON & XCHEK
Time & Date-LOG NOTE
L MFD-TEMPLATE ON
_____
```

The *XXXX color formatting command

You can change the default green-over-black color of the MFD line to colors of your choice.
All color-formatted lines begin with an asteristic * followed by a four character code:

The first two characters are for the foreground color and the last two are for the background color.

For each color definition pair of characters the first estabilishes intensity
  N-Normal
  L-Light
  B-Bright
The second assigns the color itself
  R-Red
  G-Green
  B-Blue
  C-Cyan
  M-Magenta
  W-White
  K(or any other)-Black

Limitations

The checklist can have up to 17500 characters. This includes the underscores.
All Checklist lines should not amount more than 500 lines. This includes the underscore lines.
Every line should not exceed 35 characters.Filenames inputing including paths cannot exceed 50 characters

Legal Stuff

I will not be held responsible for any damage caused by this software. Use at your own risk.
This software is FREEWARE, exempt of any commercial or currency stated value. As a consequence, it can't honestly be the object of any commercial transaction.

Thanks

After all these years, I want to make a much overdue gratitude statement to Martin Schweiger whose work, much more than a "game" , is the sign of a new era when culture can, moved by individual and consequent solidary initiatives, transcend the restrictions imposed by industry profitability. And to all Orbiter community that keeps the old dream of space exploration alive and points to a new dream of a better, friendship driven world down here.

Usage Example: The SPCCHECK.txt

_____		
BEFORE START		
Proximity Radar/EICAS-ON THEN OFF	Radio MFD	Turn the radar OFF with 2XSHFT R.
Engine Information HUD-CHECK ON	Engine Information HUD	Take a look at it and check it's there. It cannot be shut down.
Attitude Controls-CHECK OFF	HUD	Turn it OFF with SHIFT NUM /
Fuel Qty-CHECK	Engine Information HUD	Check fuel qty at HUD
Doors-CLOSE	External View	Close the doors. Check they are closing/closed.
Throttle-ON IDLE	Hardware	Check that your joysticks are centered
Aero Surfaces&RCS-FREE & CORRECT	External View	
Voice Comm Radio-ON	Checklist MFD	Turn Off the radio MUTE with SHFT-M
*Voice Comm-CHECK	Checklist MFD	Check your voice link is working."Control this is a voice link check. Over."
Planetarium NAV HUD-CHECK	HUD	Press F9 to turn it ON. Check your astronavegational system is working looking for a star of your preference. Make a wish. Press F9 to turn it OFF.
HUD-ON & CHECK ALL MODES	HUD	Turn the HUD on with H.Cycle through all modes Surface,Dock and Orbit.
HUD-SURFACE	HUD	Set HUD to Surface mode.
Time & Date HUD-ON & XCHEK	HUD	Turn it ON with key I .Cross Check the Time and date with your watch.
Time & Date-LOG NOTE	HUD	Note the Time and Date at your flight log.
L MFD-TEMPLATE ON	Template MFD	Turn on the Left MFD in Template Mode with SHFT-T
MFD Modules-CHECK ALL LOADED	SHIFT-F1 MFD	Use Shift-F1 to display the directory. Check all MFD's you need are there.
L MFD Auto Diag-GPC HAL 9000 ON	HAL 9000 MFD	Load HAL with SHFT-9.
R MFD-TEMPLATE ON	Template MFD	Turn on the Right MFD in Template Mode with SHFT-T
R MFD Alignment MFD-CHECK & SET TGT	Alignment MFD	Load Alignment MFD with SHFT A. Set its target to your convenience with SHFT-T

R MFD Xfer MFD-CHECK & SET TGT	Transfer MFD	Load Transfer MFD with SHFT X. Set its target to your convenience with SHFT-T
R MFD MAP-SET TGT & CAL	Map MFD	Load Map MFD with SHFT M. Set its target to your convenience with SHFT-T
R MFD MAP-XCHECK POSITION	Map MFD	Cross check roughly the position in the map with the location you actually are.
R MFD Surface MFD-XCHECK POS & CAL	Surface MFD	Load the surface MFD with SHFT-S. Cross check the position in the Map MFD the position shown at Surface MFD.
L MFD Surface MFD-BFS XCHECK	Surface MFD	Load another Surface MFD. The second Surface MFD is intended as your Backup Flight System. Check that, in both, the indications are the same.
L MFD Fuel Management-SET	Fuel MFD	Load the Fuel MFD with SHFT-F
Fuel Flow-XFEED	Fuel MFD	Check that, in the Fuel MFD the indication is Cross feed.
Fuel Pump-OFF	Fuel MFD	Check that, in the Fuel MFD the Pump Mode is Cross feed.
Fuel Qty-XCHECK	Fuel MFD	Cross check that the information about fuel qty, both at the Fuel MFD and the at the engine information HUD match.
Fuel Leak-CHECK	Fuel MFD	Monitor the readings of fuel qty instruments and make sure that they remain the same and do not drop which would be an indication of fuel leak.
Fuel Flow-LOAD	Fuel MFD	Set the Pump Mode to Load to keep pre launch refueling going.
Fuel Pump-AS REQUIRED	Fuel MFD	Set the pump rate accordingly.
*Weather Cond & Forecast-GET		Contact Control for Weather information.
L MFD Comms-SET	COM/NAV MFD	Load COM/NAV MFD with CTRL-C.
Transponder-SET AS BRIEFED	COM/NAV MFD	Setup transponder to the frequency assigned by control.
Initial Heading-PREDICTED&LOGGED		Calculate your inital heading.Note it down.

Key Take Off Data-PREDICTED&LOGGED		Review calculated values such as speed,altitude and MET at MECO and be sure they are all at hand.
Navaids Freq/Flt Plan-REVIEW		Review all nav references, abort procedures. Be sure everyone knows the plan.
Initial Navaids Freq-SET	COM/NAV MFD	At the COM/NAV MFD set the Inital frequncies for the starting base point and your first NAV reference.
R MFD-HSI SET & CHECK	HSI MFD	Load HSI MFD with SHFT-H. Check that the selected frequencies are shown and align the instruments accordingly.
_____ engine Information HUD-CHECK ON		
*Clearance-REQUEST	Checklist MFD	Contact Control for clearance request. "Control this is SH-15 requesting clearance to start power,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.
Thrust Levers-IDLE	Hardware	Check that your joysticks are centered, in idle position.
*Klaxon-SOUND	Checklist MFD	Sound klaxon to warn people that you are starting and they should clear the area. In space klaxon should be sounded at all relevant voice frequencies.
Surrounding Area -CHECK CLEAR	External View	Check that no EVA is being conducted nearby.
Start Sequence-START	Throttle	Give a notch at your throttle. If not possible to keep it there zero it again soon.
Engine Information HUD-MONITOR	Engine Information HUD	Look at the indications at the Engine Info HUD for the activation of the engines and fuel consumption.
_____ AFTER START		
Fuel Qty-CHECK FINAL	Fuel MFD	Refer to fuel MFD for precision. Check that you have all planned fuel for your trip.
Fuel Pump-OFF	Fuel MFD	If Pump Rate is activated, turn it OFF for the flight
Fuel Flow-XFEED	Fuel MFD	Turn OFF Fuel Conections with the tower with SHFT-M

Antennas-STOWED	External View	Check that no surfaces that cannot stand the take off effort are properly stowed.
HeatSinks-STOWED	External View	Check that no surfaces that cannot stand the take off effort are properly stowed.
Solar Cells-STOWED	External View	Check that no surfaces that cannot stand the take off effort are properly stowed.
Attitude Controls-ON(ROT)	Engine Information HUD	Turn ON the Attitude Controls with SHFT-NUM/
Aero Cntrl Surf & RCS-CHECK ACTION	External View	Use your joystick lightly or CTRL num keys to check that the RCS are firing and control surfaces are moving.
Trans/Rot RCS Switch-CHECK	Engine Information HUD	Press NUM/ and check that attitude controls mode changes are working.
Engine Gymbal-CENTER and LAUNCH	Panel	For the vectorial adjust of engines. Position them for take off.
Proximity Radar/EICAS-ON	Radio MFD	Turn the Radar ON with SHFT-R
Kill Rotation-CHECK	Panel or HUD	Press the I Key and check that KILLROT blinks at the HUD
Auto Level-ON THEN OFF	Panel or HUD	Press the L Key and check that HLEVEL is shown. Press L again to turn it OFF.
Hold Altitude-ON THEN OFF	Panel or HUD	Press the A Key and check that HOLDALT is shown. Press L again to turn it OFF.
_____		
HORIZONTAL TAKEOFF		
Prop Timer-SET TO MECO	Countdown MFD	Set Thrust Duration for the planned burn time to MECO
Prop Timer-SET POWER LEVEL	Countdown MFD	Set Power thrust to the planned power to MECO
L MFD-SURFACE	Surface MFD	Set to Surface MFD with SHFT-S
Flaps/Slats-SET FOR T/O		Set accordingly depending on ship.
Attitude Control(RCS/Aero)-SET		Set accordingly depending on ship/environment.
Elevator Trim-SET FOR T/O	Engine Information HUD	Adjust to make for a minimum stick pressure on ascent.
*Clearance-REQUEST	Checklist MFD	
*Received Clearance	Checklist MFD	

Launch Data Recorder-ON	Data Recorder MFD	Load Data Recorder MFD with Shift-U. You can't turn it off anymore if you want all your data recorded.
Thrust-VERIFY CORRECT	Engine Information HUD	Check thrust is as planned.
Ext Air Press-CHECK CORRECT	Surface MFD	Check so that you are sure your barometric altimeter is calibrated.
Brakes-RELEASE		
Landing Gear-STOW AT VR>0		Press G to bring your gear up when vertical speed develops.
_____ VERTICAL TAKEOFF		
Eng Timer Duration-MECO/TRANSITION	Countdown MFD	Set Thrust Duration for the planned burn time to MECO
Timer Mode-SET TO HOVER/MAIN	Countdown MFD	Select Thrust source with SHFT-M
Timer-SET POWER LEVEL	Countdown MFD	Set Power thrust to the planned power to MECO
Vectorial Thrust-"HOVER" FOR VTO	Panel/External View	Set position for any vectorial thrust source to vertical relative to ground.
L MFD-LANDING	VOR/VTOL MFD	Load with SHFT-L
R MFD-SURFACE	Surface MFD	Load with SHFT-S
HUD-SURFACE	HUD	Set with H
PAD VTOL ILS-CHECK INTERFACING	VOR/VTOL MFD	Check all positional and speed indications relative to pad are present.
Att Control-TRANSLATION	Engine Information MFD	Change attitude controls to translation with NUM/
*Clearance-REQUEST	Checklist MFD	Contact Control for clearance request. "Control this is SH-15 requesting clearance to start power,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.
Launch Data Recorder-ON	Data Recorder MFD	Load Data Recorder MFD with Shift-U. You can't turn it off anymore if you want all your data recorded.
AutoLevel-ON	Panel/HUD	Set Autolevel On to avoid undesired lateral translation speed components.
Thrust-ON OR AS COUNTDOWN	Countdown MFD	Set countdown or activate thrust manually.
Vector-VERT UNTILL "TOWER" CLEARED	VOR/VTOL MFD	Keep vector straight vertical to clear launch tower or pad restricted flight area.
Thrust Power-VERIFY CORRECT	Engine Information MFD	CheckThrust is as planned and match with Weight*Acceleration

Landing Gear-STOW AT VR>0		Press G to bring your gear up when vertical speed develops.
Depart Vector-TRIM	VOR/VTOL MFD	To comply with local launch procedures.
_____		
CLIMB		
AutoLevel-OFF	HUD	Turn OFF with L to prepare to Roll.
Att Control-ROTATION	Engine Information MFD	Prepare to roll.
Initial Heading/Attitude-SET	HUD	Go for planned heading to achieve orbital plane or NAV orientation.
Aux Air Dyn Surf-RETRACT		If applies, retract flaps, slats.
Thrust Levers-AS DESIRED	Hardware	Check joystick position are reasonably correct in respect to thrust setting.
Trim-AS NECESSARY	Engine Information MFD	Trim power to match planned acceleration.
Att Control (RCS/Aero)-Set to RCS	Engine Information MFD	When atmosphere density becomes too thin, you should change to RCS.
At MECO-INFORM		Make Control know that you have achieved insertion trajectory to orbit.
_____		
POST LAUNCH & ORBIT INSERTION		
HUD-ORBIT	HUD	Set using H
R MFD-ORBIT		Set MFD to Orbit MFD with SHFT-O
OMS Burn-PERFORM		Circularize at apogee to ecc nearest close to zero
-Z Translation		Make radial speed equal to zero and tangential speed to circular orbit to ecc=.000000
Aero Control Surfaces-PARK	External view	Check all aero control surfaces at parking position
HeatSinks-OPEN	External view	Open all space-only stowed devices
Antennas-DEPLOY	External view	Open all space-only stowed devices
Solar Cells-DEPLOY	External view	Open all space-only stowed devices
Planetarium NAV/Star Tracker-ALIGN	HUD	Press F9 to turn the Astronavigation HUD ON. You can point your bow to a star and crosscheck your attitude data. You can take two stars in your orbital plane to check it's correct. Press F9 to turn it OFF.

_____		
XFER PATH INSERTION		
DeltaV-PREDICT		Once your new trajectory is chosen you can calculate your deltaV
Prop time -PREDICT		As a consequence you can use BurnTime MFD to calculate the necessary Burn Time.
Fuel Consumption-PREDICT		Fuel consumption can be calculated from the data above and ship's Isp
Burn Start Time-PREDICT		Get the time from apogee or perigee you need to start countdown and countdown time
Prop Timer-SET	CountDown MFD	Set all times at Countdown MFD
Attitude-SET PROPERLY	HUD	Set Manually or through DAP to prograde or retrograde.
Auto Prograde/Retrograde-ON	HUD	To keep your attitude.
*Clearance-REQUEST	Checklist MFD	Contact Control for clearance request. "Control this is SH-15 requesting clearance to transfer burn,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.
Xfer Burn ContDown-ENGAGE	CountDown MFD	At the right time start your countdown timer.
_____		
ORBITAL APPROACH-RV ACCEL/DECCEL		
Proximity Radar/EICAS-ON	Radio MFD	Start it using SHFT-R
Comms Freq NAV1-SET TO TGT XPNDR	COM/NAV MFD	Set at NAV 1 on COM/NAV MFD so that your DOCK HUD can lock on your RV target.
HUD-DOCK	HUD	Set your HUD to DOCK Mode using H key.
*Voice Comm-CHECK	Checklist MFD	Check your voice link with your target is working."DG- 1 this is a voice link check. Over."
R MFD-ARRIVE	Arrive MFD	Call Arrive Decceleration MFD DAP with SHFT-V.
Arrive DAP-SET TGT	Arrive MFD	Set Arrive target with SHFT-T.
Decceleration Start-PREDICT	Arrive MFD	Using Arrive MFD data assign a distance to start decceleration.

*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "DG-1l this is SH-15 requesting clearance to rendez-vous approach,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.
Attitude Cntrls-ROTATION	Engine Information HUD	Prepare to attitude change with NUM/
Attitude-POINT TO TARGET	HUD	Roll and point so that the target is in the middle of your screen.
Attitude Cntrls-TRANSLATION	Engine Information HUD	Prepare to trim closing speed vector.
Rel. Speed Vector-ALIGN W/TARGET	HUD	Use translation mode RCS so that the relative velocity indicator in the DOCK HUD overlaps the target square at the middle of your screen.
Attitude-TO ACCEL/DECCEL	HUD	Turn the ship if you are going to deccelerate with your main propulsion.
Docking Procedure-REVIEW		Check you,your crew and your target agree on the proper docking procedure.
Accel/Deccel-START AS BRIEFED	Arrive MFD	Start Arrive MFD DAP with SHFT-H or apply proper acceleratation manually
_____		
DOCK		
HUD-DOCK	HUD	Set to Dock with H key.
L MFD-DOCK	Dock MFD	Load Dock MFD with SHFT-D
Dock Port Freq-CHECK CORRECT	Dock MFD	Check that the indicated dock port IDS frequency is correct. If not set it in COM/NAV MFD
Dock Port IDS -CHECK INTERFACING	Dock MFD	Check that the instrumentation docking port system is working fine noticing that all position and speed information at the Dock MFD is present and roughly correct.
Axis Alignment-MATCH AT 100M	Dock MFD	Make rotational alignment with dock axis before 100m
Ship's Hatch-FREE AND UNOBSTRUCTED	External View	Check that all devices over the hatch's path have been opened or stowed accordingly
Radial Speed-UNDER 0.5M/S at <50m	Dock MFD	

*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "DG-1, this is SH-15 requesting clearance to dock,Over."
*Received Clearance	Checklist MFD	Wait for your clearance. In the negative case reduce closing speed to zero.
Tang. Speed-UNDER 0.01M/S at <20m	Dock MFD	If not reduce closing speed to zero and realign.
Radial Speed-UNDER 0.05M/S at <5m	Dock MFD	
On Dock-CHECK "DOCKED" FLAG ON	Dock MFD	Check that the "Docked" flag is lit at the Dock MFD.
_____		
UNDOCK		
Doors/Hatches-CLOSED	Panel	Close the doors. Check they are closing/closed.
L MFD-DOCK	Dock MFD	Load Dock MFD with SHFT-D
Dock Port IDS-CHECK INTERFACING	Dock MFD	Check that the instrumentation docking port system is working fine noticing that all position and speed information at the Dock MFD is present and roughly correct.
*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "DG-1, this is SH-15 requesting clearance to undock,Over."
*Clearance Received	Checklist MFD	Wait for your clearance.
Attitude Controls-TRANSLATION	Engine Information HUD	Select with NUM/ .Only translation movements must be done untill safe distance.
Launch Data Recorder-ON	Data Recorder HUD	
Thrust-OFF	Hardware	Check your Joysticks are safe.
Ext Air Press-CHECK CORRECT	Surface MFD	Load Surface MFD and check air pressure before undocking.
Docking Latches-RELEASE		Undock with CTRL-D
On Undock-CHECK "DOCKED" FLAG OFF	Dock MFD	Check that the "Docked" flag is OFF at the Dock MFD.
Depart Vector-MONITOR & TRIM	Dock MFD	Trim for a zero tangential speed depart vector untill safe distance.
_____		
DEORBIT BURN		
Map MFD-SET TARGET	Map MFD	Load Map MFD and set target Base with SHFT-T.

Deorbit Angle -PREDICT		Predict the deorbit burn angle to reach desired altitude over target base.
Deorbit DeltaV-PREDICT		Predict deltaV needed to insertion in the deorbit path
Prop time -PREDICT		Calculate burn time to achieve planned delta V
Fuel Consumption-PREDICT		Calculate fuel spent to achieve planned delta V
CountDown Start Tgt Angle-PREDICT		Estabilish countdown duration and add it to the deorbit burn angle to get start countdown angle.
Timer Duration-SET TO DEORBIT BURN	Countdown MFD	Set Countdown MFD burn time.
Timer Countdown-SET AT START ANGLE	Countdown MFD	Input countdown time above.
Antennas-STOW	External View	Check that no surfaces that cannot stand the reentry effort are properly stowed.
HeatSinks-STOW	External View	Check that no surfaces that cannot stand the reentry effort are properly stowed.
Solar Cells-STOW	External View	Check that no surfaces that cannot stand the reentry effort are properly stowed.
HUD-ORBIT	HUD	Select ORBIT mode HUD with H key
Current Orbit-TRIM	Surface/Orbit MFD's	In order to achieve precision deorbit, adjust your current orbit to match what you used as initial conditions in your calculations.
Elevator Trim-SET FOR REENTRY	Engine Information HUD	In the case of atmospheric descent, adjust to make for a minimum stick pressure on descent.
Key Reentry Data-CONFIRM		Check that the whole crew agrees about the relevant data for reentry such as speeds,attitudes and navaids.
Navaids Freq/Flt Plan-CONFIRM		Confirm that the NAV frequencies are correct
Initial Navaids Freq-SET	COM/NAV MFD	Set navaids frequencies at COM/NAV HUD
Auto Retrograde-ON	HUD	Estabilish Deorbit burn attitude.
R MFD-SET GEOSYNC TGT	GeoSync MFD	Load Geosync MFD and set target base with SHFT-T
Intercept Path-TRIM USING GEOSYNC	GeoSync MFD	Trim your flight path to get the closest distance using GeoSync MFD and translation mode RCS.

R MFD HSI-SET & CHECK	HSI MFD	Assign NAV frequencies to each HSI indicators
Delta V and Fuel-CHECK BRIEFED		Check that you have enough fuel for the whole return procedure.
*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "Control this is SH-15 requesting clearance to deorbit burn,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.
Countdown -ACTIVATE	Countdown MFD	At countdown start angle to target, initiate contdown.
_____ ATMOSPHERIC DESCENT		
Auto retrograde-OFF	HUD	Turn Auto Retrograde OFF to set for reentry attitude.
Path-TRIM USING GEOSYNC	GeoSync MFD	Trim your flight path to get the closest distance to target using GeoSync MFD and translation mode RCS.
Attitude-PROGRADE	HUD	Return to prograde attitude after deorbit burn.
HUD-ORBIT	HUD	Keep HUD at ORBIT mode.
Pitch-SET FOR REENTRY	HUD/Surface MFD	Adjust pitch for reentry.
Elevator Trim-SET FOR REENTRY	Engine Information HUD	Adjust to make for a minimum stick pressure on descent.
R MFD-CHECK TGT VOR FREQ SET	COM/NAV MFD	Check that the VOR frequency for your target base is correct.
Descent Path-TRIM USING GEOSYNC	GeoSync MFD	Trim your flight path to get the closest distance to target using GeoSync MFD and translation mode RCS.
XPNDER-CHECK FREQ AS BRIEFED	COM/NAV MFD	Check that your transponder frequncy is the one given by control.
Whitin VOR Range-CHECK VOR ID	VOR/VTOL MFD	Each time a VOR is received it`s necessary to check that it's really your target base VOR. So check the ID at the top of VOR MFD to be sure.
HUD-SURFACE	HUD	Set HUD to Surface mode.
AeroBrakes- ON		If neccessary engage airbrakes.
*Voice Comm-CHECK	Checklist MFD	Check your voice link with your target is working."Control this is a voice link check. Over."

Approach Procedure-REVIEW		Check everyone is aware of your current target base particular approach procedures.
_____ VACUUM DESCENT AND DECCELERATION		
Auto retrograde-OFF		Turn Auto Retrograde OFF to set for reentry attitude.
HUD-ORBIT	HUD	Keep HUD at ORBIT mode.
Attitude-BANK ZERO DG & RETROGRADE	HUD/Surface MFD	Go to retrograde attitude. Bank to keep zero degree bank with surface, as shown in Surface MFD
Target Altitude over base-BRIEF		Decide on which altitude you want to be when over target base.
Decceleration Distance-PREDICT		According with the decceleration your ship can provide decide what's the distance you are going to start deccelerating.
Arrive Deccel DAP-SET TGT BASE	Arrive MFD	Load Arrive MFD and set target base
Descent Path-TRIM USING GEOSYNC	GeoSync MFD	Trim your flight path to get the closest distance to target using GeoSync MFD and translation mode RCS.
R MFD-CHECK TGT VOR FREQ SET	COM/NAV MFD	Check that the VOR frequency for your target base is correct.
XPNDER-CHECK FREQ AS BRIEFED	COM/NAV MFD	Check that your transponder frequncy is the one given by control.
L MFD Landing-SET	VOR/VTOL MFD	Load VOR/VTOL MFD with SHFT-L
Whitin VOR Range-CHECK VOR ID	VOR/VTOL MFD	Each time a VOR is received it`s necessary to check that it's really your target base VOR. So check the ID at the top of VOR MFD to be sure.
HUD-SURFACE	HUD	Set HUD to Surface mode.
Attitude - HORIZONTAL LEVEL	HUD	Align your attitude to zero bank and zero pitch.
Descent Path-TRIM USING VOR	VOR/VTOL MFD	By the time you have a good VOR reception, readjust your path using its reference.
*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "Brighton, this is SH-15 requesting clearance to approach,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.

Deccel Start Pnt-ARRIVE DAP H ON	Arrive MFD	At Deccelleration start point initiate your decceleration.
Vert Vel-TO ZERO AT TGT ALTITUDE	Surface MFD	Bring your vertical speed SLOWLY to zero at the planned altitude over base.
Tgt Altitude and VR=0-ALTHOLD ON	HUD	Only when your vertical speed is zero and you are at the intended altitude you can engage the altitude hold DAP.
Approach Procedure-REVIEW		Check everyone is aware of your current target base particular approach procedures.
_____ ATMOSPHERIC SURFACE APPROACH		
Att Control (RCS/Aero)-AS REQUIRED	Panel	
Aux Air Dyn Surf-DEPLOY	External View	
HUD-SURFACE	HUD	
*Voice Comm-CHECK	Checklist MFD	
Proximity Radar/EICAS-ON	Radio MFD	
HSI-SET & CHECK	HSI MFD	
HSI Frequencies-CONFIRM CORRECT	COM/NAV MFD	
*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "Cape, this is DG-1 requesting clearance to approach,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.
Weather Conditions-CHECK		Contact Control for Weather information.
Aux Air Dyn Surf-AS BRIEFED	External View	Set flaps, slats according to the requirements of your ship and environment.
Speed-TRIM TO BRIEFED GLIDE	Surface MFD	Adjust your speed to meet glide approach.standards.
Thrust-TRIM TO BRIEFED GLIDE	Surface MFD	Be sure that thrust is adequate to keep intended glide.
Glide Angle-TRIM	HSI MFD	Adjust to be whithin ILS constraints.
_____ HTOL LANDING "FINAL"		
Landing Gear-DEPLOY & CONFIRM	External View	Press G key.Make sure gear is down.
Aux Air Dyn Surf-SET FOR LANDING	External View	Set flaps, slats according to the requirements of your ship and environment.
*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "Cape, this is DG-1 requesting clearance to land,Over."

*Received Clearance	Checklist MFD	Wait for your clearance.
Touchdown Airspeed-CHK AS BRIEFED	Surface MFD	Set to touchdown speed.
Touchdown Thrust-CHK AS BRIEFED	Hardware	Set to touchdown.
_____		
HTOL TOUCHDOWN		
Thrust Levers-RETRO	Engine Information MFD	Engage retro immediately after touchdown to reduce speed over the runway.
Thrust Levers-CLOSED AT < 65m/s	Engine Information MFD	At brake speed stop applying retro.
Brake-AS NECESSARY AT < 65m/s		You can use the brakes now.
_____		
VTOL LANDING "FINAL"		
AUTO HLEVEL-ACTIVE	HUD	Set Autolevel On to avoid undesired lateral translation speed components.
Main and Retro-CONFIRM CUT	Engine Information MFD	Check that there is no residual activation of your engines from earlier maneuvres.
*Clearance-REQUEST	Checklist MFD	Contact target for clearance request. "Cape, this is DG-1 requesting clearance to land,Over."
*Received Clearance	Checklist MFD	Wait for your clearance.
VTOL MFD-SET & CHECK	VOR/VTOL MFD	
VTOL MFD Freq-CONFIRM CORRECT	VOR/VTOL MFD	
Proximity Radar/EICAS-ON	Radio MFD	
Landing Gear-DEPLOY & CONFIRM	External View	Press G key.Make sure gear is down.
Gravity Compensator-ON	Arrive MFD	Turn Gravity Compensator on at the Arrive MFD DAP with SHFT-G to make your landing easier.
Rate of Descent-IN SPEC	VOR/VTOL MFD	Monitor your rate of descent at VTOL MFD . Should be yellow all the time. If it turns red reduce your vertical speed.
Thrust Levers-AS BRIEFED	Hardware	
_____		
VTOL TOUCHDOWN		
Engines-OFF	Engine Information MFD	Reduce Thrust to zero immediately after touchdown
Gravity Compensator-OFF	Arrive MFD	Turn Gravity compensator OFF immediately with SHFT-G
AUTO HLEVEL-OFF	HUD	Turn Auto leveler off immediately presssing L Key

_____		
PARKING		
Proximity Radar/EICAS-OFF	Radio MFD	Turn Radar OFF with SHFT-R.
Aux Air Dyn Surf-STOW	External View	Stow all flaps ,slats,airbrakes a.s.o.
Aero Control Surfaces-PARK	External View	Park elevons and airelons at middle position.
Attitude Controls-OFF	Engine Information HUD	Turn it OFF with SHFT-NUM/
Elevator Trim-MID POSITION	Engine Information HUD	Set Elevator trim to zero.
Vector Thrust-MID POSITION		Set any vectorial thrust to its centered position.
Fuel Control Switches-CUTOFF	Fuel MFD	
HUD-OFF	HUD	Turn HUD OFF with CTRL-H
Ext Air Press-CHECK	Surface MFD	Check outside pressure with surface MFD.
Door-UNLOCK/OPEN	External View	Open the doors.
Date Time Date HUD-LOG NOTE AND OFF	HUD	Log final time at your flight Log and turn calendar/watch HUD using I key.
Voice Radio-OFF	Radio MFD	Turn Voice Radio OFF with SHFT-M.
R MFD-OFF		Turn MFD OFF with SHFT-Q
L MFD-OFF		Turn MFD OFF with SHFT-Q